

## WHAT IS CLAIMED IS:

1. A flame-retardant material used for ensuring a target object, which mainly comprises a polymer material, flame retardancy as being dispersed therein or immobilized on the surface thereof,

wherein the flame-retardant material contains a group expressed as  $N_xO_y$  (where, x and y are natural numbers) and a group capable of generating water upon heating.

2. The flame-retardant material according to Claim 1, wherein the group expressed as  $N_xO_y$  (where, x and y are natural numbers) is contained in a form of a compound selected from the group consisting of nitric acid compound, nitrous acid compound and hyponitrous acid compound.

3. The flame-retardant material according to Claim 2, wherein the nitric acid compound, nitrous acid compound and hyponitrous acid compound have non-metallic nature.

4. The flame-retardant material according to Claim 2, wherein the nitric acid compound, nitrous acid compound and hyponitrous acid compound are subjected to surface treatment for improving the affinity with the target object.

5. The flame-retardant material according to Claim 4, wherein the surface treatment is given by using any one agent selected from the group consisting of those of Si-base, Ti-base, Al-base, olefin-base, aliphatic acid-base, oil-and-fat-base, wax-base and detergent-base.

6. The flame-retardant material according to Claim 4, wherein the

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surface treatment is coating with a vitreous precursor composition capable of generating vitreous ceramic upon heating onto such nitric acid compound, nitrous acid compound and hyponitrous acid compound.

5 7. The flame-retardant material according to Claim 1, wherein the group capable of generating water upon heating is contained in a form of a hydroxyl-group-containing compound.

10 8. The flame-retardant material according to Claim 7, wherein the hydroxyl-group-containing compound is a metal hydroxide.

15 9. The flame-retardant material according to Claim 8, wherein the metal hydroxide mainly comprises any compound selected from the group consisting of aluminum hydroxide, magnesium hydroxide and calcium hydroxide.

20 10. A flame-retardant material used for ensuring a target object, which mainly comprises a polymer material, flame retardancy as being dispersed therein or immobilized on the surface thereof,

wherein the flame-retardant material contains a compound selected from the group consisting of nitric acid compound, nitrous acid compound and hyponitrous acid compound, together with a hydroxyl-group-containing compound.

25 11. The flame-retardant material according to Claim 10, wherein the hydroxyl-group-containing compound is a metal hydroxide.

12. The flame-retardant material according to Claim 11, wherein the

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metal hydroxide mainly comprises at least any one compound selected from the group consisting of aluminum hydroxide, magnesium hydroxide and calcium hydroxide.

13. The flame-retardant material according to Claim 10, wherein the nitric acid compound, nitrous acid compound and hyponitrous acid compound have non-metallic nature.

14. A flame-retardant material used for ensuring a target object, which mainly comprises a polymer material, flame retardancy as being dispersed therein or immobilized on the surface thereof,

wherein the flame-retardant material contains a compound selected from the group consisting of nitric acid compound, nitrous acid compound and hyponitrous acid compound, together with a compound having a hydroxyl group and a crystal water.

15. A flame-retardant polymer material having a matrix comprising a polymer material having dispersed therein a flame-retardant material which contains a group expressed as  $N_xO_y$  (where, x and y are natural numbers) and a group capable of generating water upon heating.

16. A flame-retardant polymer material having a matrix comprising a polymer material having immobilized on the surface thereof a flame-retardant material which contains a group expressed as  $N_xO_y$  (where, x and y are natural numbers) and a group capable of generating water upon heating.

17. A flame-retardant polymer material having a matrix comprising a

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polymer material having dispersed therein a flame-retardant material which contains a compound selected from the group consisting of nitric acid compound, nitrous acid compound and hyponitrous acid compound, together with a hydroxyl-group-containing compound.

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18. A flame-retardant polymer material having a matrix comprising a polymer material having immobilized on the surface thereof a flame-retardant material which contains a compound selected from the group consisting of nitric acid compound, nitrous acid compound and hyponitrous acid compound, together with a hydroxyl-group-containing compound.

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19. A flame-retardant material used for ensuring a target object, which mainly comprises a polymer material, flame retardancy as being dispersed therein or immobilized on the surface thereof,

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wherein the flame-retardant material contains a combustion-inhibitory oxidative decomposition accelerator which oxidatively decomposes such polymer material upon heating to thereby ensure such target object combustion-inhibitory property.

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20. The flame-retardant material according to Claim 19, wherein the combustion-inhibitory oxidative decomposition accelerator is at least one compound selected from the group consisting of nitric acid, nitric acid compound, permanganate, chromic acid, chromic acid compound, peroxide, salt of peroxyacid, salt of sulfuric acid, oxygen-base substance and oxide.

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21. The flame-retardant material according to Claim 19, wherein the combustion-inhibitory oxidative decomposition accelerator contains a nitrogen compound and a hydroxyl-group-containing compound.

22. The flame-retardant material according to Claim 21, wherein the target object is given with the flame retardancy through a process in which, at the combustion temperature of the polymer material or at a lower temperature than such combustion temperature, nitrogen oxide generated from the nitrogen compound and water generated from the hydroxyl-group-containing compound react with each other to produce nitric acid, and such nitric acid denatures the polymer material by thermal oxidation to produce non-combustible components such as CO<sub>2</sub> and H<sub>2</sub>O.

23. The flame-retardant material according to Claim 21, wherein the hydroxyl-group-containing compound is a metal hydroxide, and the nitrogen compound is a nitric acid compound having a decomposition temperature of 50 to 600°C.

24. A flame-retardant material used for ensuring a target object, which mainly comprises a polymer material, flame retardancy as being dispersed therein or immobilized on the surface thereof,

wherein the flame-retardant material contains a combustion-inhibitory oxidative decomposition accelerator which oxidatively decomposes such polymer material at the combustion temperature of the polymer material or at a lower temperature than such combustion temperature to thereby ensure such target object combustion-inhibitory property.

25. The flame-retardant material according to Claim 24, wherein the combustion-inhibitory oxidative decomposition accelerator oxidatively decomposes the polymer material at the combustion temperature of the

polymer material or at a lower temperature than such combustion temperature to produce non-combustible components such as  $\text{CO}_2$  and  $\text{H}_2\text{O}$ .

26. The flame-retardant material according to Claim 24, wherein the combustion-inhibitory oxidative decomposition accelerator contains at least one compound selected from the group consisting of nitric acid, nitric acid compound, permanganate, chromic acid, chromic acid compound, peroxide, salt of peroxoacid, salt of sulfuric acid, oxygen-base substance and oxide.

27. The flame-retardant material according to Claim 24, wherein the combustion-inhibitory oxidative decomposition accelerator contains a nitrogen compound and a hydroxyl-group-containing compound.

28. The flame-retardant material according to Claim 27, wherein the nitrogen compound is a compound selected from the group consisting of metal nitrate, nitric acid ester and ammonium nitrate.

29. The flame-retardant material according to Claim 27, wherein the target object is given with the flame retardancy through a process in which, at the combustion temperature of the polymer material or at a lower temperature than such combustion temperature, nitrogen oxide generated from the nitrogen compound and water generated from the hydroxyl-group-containing compound react with each other to produce nitric acid, and such nitric acid denatures the polymer material by thermal oxidation to produce non-combustible components such as  $\text{CO}_2$  and  $\text{H}_2\text{O}$ .

30. A flame-retardant polymer material mainly comprising a polymer

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component, wherein such flame-retardant polymer material shows in a spectrum of TDS analysis (thermal decomposition spectroscopy) *in vacuo* a peak attributable to a combustion-related gas component generated within a combustion temperature range of the polymer component, and a peak attributable to a combustion-inhibitory gas component containing at least a group expressed by  $\text{CO}_x$  ( $x$  is a natural number) and generated within a temperature range lower than the combustion temperature range of the polymer component.

31. A flame-retardant polymer material mainly comprising a polymer component, wherein such flame-retardant polymer material shows a spectrum of TDS analysis (thermal decomposition spectroscopy) *in vacuo* in which a peak profile attributable to a combustible gas component generated by decomposition reaction of the polymer component; and a peak profile attributable to a non-combustible gas component generated as a decomposition product of the polymer component within a temperature range lower than that responsible for the start of the generation of such combustible gas component.